

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of :

T.D. Erickson, et al

Group Art No. 2145

Serial No. 10/628,217

Examiner: M. Kianersi

Filed: July 28, 2003

for IBM Corporation
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Title: AGENDA-DRIVEN MEETINGS

DECLARATION OF PRIOR INVENTION IN THE UNITED STATES
TO OVERCOME CITED PATENT OR PUBLICATION (37 C.F.R. 1.131)

Commissioner for Patents
Sir:

1. This declaration is submitted to establish completion of the invention that is the subject of the above-referenced patent application in the United States at a date prior to July 2003, which is the earliest effective date of the Donath article, entitled "Viisualizing Conversation", as cited by the Examiner in the prosecution of the above-identified patent application.

2. The people making this declaration are Thomas D. Erickson, Wendy A. Kellogg, Peter K. Malkin, and Tracee L. Wolf, the original joint inventors who are the present applicants for the pending patent application.

3. To establish conception of the invention prior to the effective date of the reference, coupled with due diligence

from prior to said date to the filing of the application, the following attached documents are submitted as evidence:

a draft for a patent application dated 3/3/2003 and including figures having earlier dates in 2003;

a docket creation record from the IBM database indicating that a docket was created on April 4, 2003 to prepare a patent application for the invention disclosures; and

the main idea records for invention disclosures, YOR820001082 and YOR820010404 showing archiving dates of 6/5/03 on which the main ideas of the invention disclosures were archived in the IBM database.

From these documents, it can be seen that the invention in this application was conceived of at least by the date of July 1, 2003, which is a date earlier than the effective date of the cited reference, and that constructive reduction to practice, in the form of the filing of a patent application, was diligently pursued from the time of conception to the docketing date and the patent application filing date of July 28, 2003

4. As a person signing below:

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or of any patent which may issue thereon.

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Agenda-Driven Meeting GUI

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FIELD OF THE INVENTION

This invention relates to a graphical user interface for an online collaboration environment.

BACKGROUND OF THE INVENTION

Suppose you go finally manage to connect to an online meeting that you were supposed to attend, but you show up after a significant amount of work has already been completed. How do you learn what's already been done? How do you determine the current agenda item? And how do you figure out what's still to come?

Many technical solutions have been developed which address one or more of these questions.

NNTP or network news (see Ed Krol, *The Whole Internet Catalog*. O'Reilly and Associates, Inc. Sebastopol, CA. 1992 for details) provides a venue in which users can asynchronously post messages and responses into administered news groups (i.e., predefined groups of messages which are meant to relate to specified topic, e.g., all articles in alt.sport.soccer should deal with soccer). Only loosely structured forms of interaction are provided, e.g., query-and-respond. No other styles of interaction are supported. In particular, there is no way for users to define or

participate in a particular style of interaction in which there is a predefined, interrelated sequence of phases, all newsgroups being independent from one another.

Internet Relay Chat (IRC) (see Ed Krol, *The Whole Internet Catalog*. O'Reilly and Associates, Inc. Sebastopol, CA. 1992 for details) is similar to NNTP in that it allows users to post messages and responses to each other in predefined topic areas - called channels in IRC. The main difference with IRC is that the interactions are synchronous rather than asynchronous as in NNTP. Just as with NNTP, IRC does not enable users to define or participate in a particular style of interaction in which there is a predefined, interrelated sequence of phases, all channels being independent from one another.

Loom, a visualization tool for Usenet (NNTP) news groups, (for details, see Judith Donath et al. "Visualizing Conversation" published in the *Journal of Computer Mediated Conversation*. Volume 4, number 4, June 1999) provides a technique for displaying the emotional mood (e.g., hostile, happy) of an NNTP-based online community (e.g., a Usenet newsgroup) by analyzing the content of its interactions. Although this utility can analyze online interactions and provide a graphical representation of aspects of the interactions, it does not provide users with a sequenced, multiphase style of interaction, or an associated graphical user interface.

Babble (for details, see Thomas Erickson, et al. "Socially Translucent Systems: Social Proxies, Persistent Conversation, and the Design of 'Babble.'" published in *Human Factors in Computing Systems: The Proceedings of CHI '99*. ACM Press, 1999.) provides dynamic indicators of the presence and activity of all operational users with respect to the available topics (i.e., discussion areas created by the users). These indicators are computed using the activities of the participants (e.g., connections, postings and topic switches). Although lightly structured styles of interaction

are frequently adopted (e.g., interaction in the “-Commons Area-” is informal conversation, while interaction in the “Babble Problems” topic consists of serious question/answer dialogs), no way is provided to define a sequenced, multiphase style of interaction.

Online games, like chess and bridge (e.g., Chessmaster 6000 by Mindscape, Inc.) provide structured and enforced styles of interaction, but not ones that (1) can be defined by the users, the rules all being predefined; (2) that can have the rules changed by the users *during* a game (e.g., “A queen can leap from anywhere to anywhere”).

Coordinator and its patented method of structuring human communications (for details see: Flores et al. “Method and Apparatus for Structuring and Managing Human Communications By Explicitly Defining the Types of Communications Permitted Between Participants.” U.S. patents numbers 5,208,748 May, 4, 1993.) provides an electronic mail-based system that allows users to structure conversations and track tasks. For example, a typical interaction begins with a "Request" message from person A to person B, requesting something from person B by a certain date. This e-mail note asks Person B to respond with a "Promise" message (promising to perform the action), with a "Decline" message (declining to perform the action), or with a "Counteroffer" message (offering to perform the action by a different date or to perform a different action). If B promises to do the action, then a typical conversation might continue with B eventually sending a "Report completion" message (indicating that the action has been performed) and A replying with a "Close" message (indicating that the action was performed satisfactorily).

The Oval implementation of Coordinator extends the base functionality by allowing end-users to modify interaction rules mid interaction (for details, see Malone et al. “Experiments with Oval:

A Radically Tailorable Tool for Cooperative Work” via URL

<http://ccs.mit.edu/papers/CCSWP181/index.html#4b>.

Thus Coordinator, implemented with Oval allows users to define and maintain structured styles of online interaction. Users are still unable to handle interactions where messages are posted to a group of recipients, all of whom are not known a priori (e.g., as is the case in an brainstorming session where the participants include any and all contributing online users). Coordinator/Oval also does not provide a dynamic, graphical representation giving users with an overview and interface to a given meeting. In addition, no method or interface is provided allowing users to replay all or a section of a given meeting.

Domino, a product of IBM/Lotus, provides persistent storage and access to individual databases, but does not provide a dynamic, graphic representation of a goal-driven, multiphase meeting.

The graphical user interface and online interaction method enabled by **Genre Palettes: Method Enabling User-Defined Structured Styles of Interaction Online Including Enforcement, IBM Docket Y0R9-2000-0122**, allows users to define and interact in specialized online environment, e.g., an online lecture or debate. This invention still does not supply a dynamic graphic representation of a multiphase online meeting, nor one that provides users with an overview of all of the separate agenda item interactions.

Work Flows allow users to specify sequences of steps, e.g., the steps required to fill out, submit and process a travel expense report, but do not provide users with a dynamic graphic representation of a multiphase online meeting, one providing users with an overview of all of the separate agenda item interactions (including indications of activity: who, what and how active).

Thus, there remains a need for a system and method providing online users with a dynamic graphic representation of the overview an agenda-driven, multiphase online meeting, one enabling users to replay previous activity.

Sametime Meeting, a product of IBM/Lotus allows users to create and interact with an instance of an online meeting, this interaction including the display of text, multimedia and compound documents, the environment providing indication of users' active connection to a given instance. Sametime Meeting does not, however, provide any way of specifying an agenda, this agenda indicating the phases of the meeting, or the order in which the phases are to be completed.

SUMMARY OF THE INVENTION

The goal of an “agenda-driven meeting” (ADM) is to allow a distributed work group, committee, or task force to have an online, not necessarily synchronous meeting to review the status of various ongoing projects. An ADM is created by first defining an “agenda,” consisting of a list of “items” (e.g., goals). Each agenda item defines a phase, which is represented by a phase-shape, within which the given item is discussed.

Four sorts of objects can be created in each phase:

- **Utterances:** An utterance is a labeled, time-stamped textual comment, which, with other utterances, make up the conversation in a room.
- **Pointed Queries:** Pointed Queries are questions which can be directed to one or more participants. A Pointed Query will call itself to the attention of a user, either directly (if the user is logged onto the system), or (after a predetermined time) will send itself as email to the user. The recipient of the emailed-pointed query can either click on a link to go to pointed query in the context of the online system, or can type an answer (including checking a “don’t know”) box.

- **To Do's** (which may optionally be assigned to particular people)
- **Glosses** (which are typically summaries of the state of an agenda item)

All objects, including phases, can have various states:

- **Open/Locked**: An object that is “open” can be entered, edited, or answered, as appropriate;
- **New Information/Seen** (relative to a user): An object that has been created or contains new or changed content since a user last ‘looked at’ it is in the “New Information” state relative to that user.
- **Glitter/No Glitter** (relative to a user): “Glitter” is a state that can be applied to an object by a user, to attract the attention of another user; it may have an optional note attached to it.

By making user actions visible and public via its structure, the current invention supports social awareness, which enables and allows the group to enforce (or not) the interactional coherence of the group via social mechanisms such as peer pressure, imitation and etiquette.

The user interface consists of two interrelated parts: A phased social proxy that explicitly depicts the presence and activities of the participants in each phase of the conversation; and a multipaned phased representation of the conversation that depicts the conversation itself and the products of each of its phases.

The two components of the present invention, acting separately and in tandem, support the formation of group awareness, i.e. allow participants to know what others are doing, as well as supporting awareness of others' awareness. This group awareness is essential to the present invention in that it aims to support coherent group interaction (e.g. everyone attending to the

same conversational phase) without rigidly mandating it. The following are the key aspects of social awareness that are supported:

- In-phase versus out-of-phase (Who is where right now): Both components of the user interface make it easy to see who (and how many) of those synchronously present are in the “current” phase (as defined by the group), versus other phases. In the social proxy this can be seen by the distribution of dots in the various components of the phase-spaces; and
- Active versus inactive (who is active right now): The phased social proxy allows participants to assess the degree of activity of the members of the group by noting the position of participants’ dots relative to the center of each phase space, as described in 1.2

Another benefit of the present invention is that both the Phase Conversation Representation and the Phased Social Proxy, by adding structure and richness to the conversation, permit it to be archived in novel forms:

- The archiving of the content for each phase: A result of the use of the present invention for carrying out semi-structured conversations is a persistent archive of the conversation with its contents organized according to conversation phases.
- The archiving of conversational activity: Because the activity of conversations participants is archived, the conversation can be replayed. Participants, or others interested in the conversation, can replay it at high speed to get a sense of the number of participants in each phase, the degree of coherence, and so on.

BRIEF DESCRIPTION OF THE FIGURES

The foregoing and other objects, aspects, and advantages will be better understood from the following non limiting detailed description of preferred embodiments of the invention with reference to the drawings that include the following:

Figure 1 shows an example of an agenda-driven meeting in process, which includes text and artifact display panes;

Figure 2 shows an example of an alternative agenda-driven meeting;

Figure 3 shows an example of a workflow-based agenda-driven meeting;

Figure 4 shows an example of an agenda-driven meeting that includes a loop;

Figure 5 depicts an overview of the network topology of an embodiment of the present invention;

Figure 6 is a block diagram of an architecture of a server according to an embodiment of the present invention;

Figure 7 is a flow diagram of the of a server program architecture according to an embodiment of the present invention;

DETAILED DESCRIPTION OF THE INVENTION

A detailed example of the preferred embodiment, is given, describing how the current invention is used in the process of supporting a design meeting. An example of this is depicted in Figure 1. The user interface 1000 consists of two interrelated parts: A phased social proxy 1010 that explicitly depicts the presence and activities of the participants in each phase of the meeting; and a phased conversation representation 1015 that depicts the topics of the meeting's phases, the

dialog of the current, and artifacts (e.g. Documents and drawings) related to or produced during the meeting. The phased social proxy 1010 representing the meeting is a public representation - that is, all participants see the same representation, and all know that the others see the same representation.

The phased social proxy 1010 represents a given meeting by a series of simple phase-shapes 1050 - 1090 connected by lines 1100 - 1130,- each phase-shape corresponding to a particular phase of the meeting. By convention, the leftmost phase-shape 1050 is the first phase of the meeting, with the phase-shapes to the right 1060 - 1090 representing later phases respectively. One will appreciate that the line segments 1100 - 1130 could include arrow heads to indicate this sequencing explicitly. The phase-shape 1060 that depicts the "current" phase in which the group is involved expands to dominate the social proxy 1010; the other phase-shapes 1050 and 1070 - 1090, remain visible, but smaller. When the group progresses to the next phase (i.e., phase 3), this new phase becomes the "current" phase, its phase-shape (1070) expands, and the previous, completed phase-shape 1060 shrinks and becomes shaded. By differentiating the phase-shape of the current phase, participants are given a clear indication of the primary topic of interest. One will appreciate that other methods could be employed to distinguish the phase-shape of the current phase, including, but not limited to having it appear in a unique color or shape. One will also appreciate that the phased social proxy can be dynamically positioned so that the phase-shape representing the current phase is located centrally in the center of the 1010 space.

The meeting participants are represented as small dots 1135 - 1160, and are positioned in the phases social proxy 1010 according to which phase they are currently involved in. Normally, most or all participants will be in the "current" conversation phase 1060; however, nothing

prevents a given user from moving to a different phase, depicted by dot 1135 in phase-shape 1050.

When participants are active in the conversation (activity meaning that they ‘speak’ (e.g., contribute a comment), use a tool, or simply ‘listen’ (scroll the conversation phase-pane)), their dot (one of 1135 - 1160) moves into the center of the appropriate phase-space (one of 1050 - 1090); as they are idle, their dot drifts to the phase-space’s periphery. This graphical depiction of the level of activity is just like that used in Babble (for details, see Thomas Erickson, et al. "Socially Translucent Systems: Social Proxies, Persistent Conversation, and the Design of 'Babble.'" published in Human Factors in Computing Systems: The Proceedings of CHI '99. ACM Press, 1999).

Note that since the phased social proxy 1010 is public and, hence, seen equally by all participants, if a given user does move to a phase other than the current one, their movement will be visible to the entire group. This explicit indication provides a powerful “social affordance,” one that can press users to restrict their activities to the current phase so that their actions conform to that of the group. Alternatively, suppose a user does turn their attention to a previous phase, causing their dot 1135 to move to a noncurrent phase-shape 1050. Other participants seeing this might begin to wonder why someone is still looking at this phase. Perhaps there remains resolved issues related to this phase. Perhaps the participant represented by dot 1135 came to the meeting late, and is reviewing the previous phase to catch up to the other participants.

The phased social proxy 1010 also includes representations of tools, shown here as small squares 1280 and 1290. Each of these shapes 1280, 1290 launches a different application that can aid

users in the completion of the current phase. Such applications can include, but are not limited to, a timer, with which users can measure how long a given discussion takes; a voting application, with which users can make a final decision by casting votes for or against a given proposal or conclusion, or a random number generator, the products of which users can employ to make decisions (e.g., who will write up the summary of the given phase).

The current invention also includes a multipaned representation of the content of the meeting 1015, consisting of three panes:

- The goal pane 1020 indicates the goal of each phase, 1170 - 1210. One will appreciate that these entries can include, but are not limited to titles (like those shown 1170 - 1210), short descriptions, and graphic images;
- The conversation pane 1030 displays the comments 1230 - 1260 of the conversation phase that a particular participant is viewing. Note that if user 1 has selected phase 1, the pane 1030 they see will show the conversation from phase 1, while if user 2 has selected phase 2, they are shown the content of phase 2.

Also note that for any given phase, the title 1120 of the conversation pane 1030 will match indicate some or all of the data of the phase's corresponding goal pane entry. E.g., since phase 2 is the selected phase shown in figure 1, "Phase 2: Develop Design" 1180 from the goals pane 1020 is displayed as the title 1220 of the conversation pane 1030.

Further, when one or more participants decide to leave the "current" phase, and move into another (previous or future phases), all participants in the current phase are shown a translucent image, or "shadow pane" of noncurrent dialog, slightly offset from the standard window 1030. This is deliberately intended to be visible and even slightly distracting; since the out-of-phase

participants know that their activities are visible and may distract the rest of the group (in the same way participants in a face-to-face meeting know that side conversations may disrupt a meeting), it encourages but does not mandate adherence to the group activity.

- The products pane 1040 provides pointers to artifacts related to or produced during the meeting. These pointers can include, but are not limited to URLs of text, image and mixed type documents.

The content of the both the goals 1020 and product 1040 panes remains the same regardless of which phase-shape a given user has selected.

Note that since all of the data in the current invention is maintained persistently, it can be viewed or heard by those who are not present.

A final feature of the conversation representation is that participants may attach annotations (similar to ‘sticky notes’) to a noncurrent conversation phase. These allow participants to add information, even though the primary content of a phase is frozen, or may not yet be created. These presence of such annotations is indicated by the thickening of relevant phase-shape’s line width. Note the difference in the width of 1050 versus 1060 - 1090. One will appreciate that other graphic representations of the presence of such annotations exist including, but not limited to changing the color or line type of the relevant phase-shape.

The two components of the present invention 1010 and 1015, acting separately and in tandem, support the formation of group awareness, i.e. allow participants to know what others are doing, as well as supporting awareness of others’ awareness. This group awareness is essential to the present invention in that it aims to support coherent group interaction (e.g. everyone attending to

the same conversational phase) without rigidly mandating it. The following are the key aspects of social awareness that are supported:

- In-phase versus out-of-phase (Who is where right now): Both components of the user interface 1010 and 1015 make it easy to see who (and how many) of those synchronously present are in the “current” phase (as defined by the group), versus other phases. In the social proxy 1010 this can be seen by the distribution of dots in the various components of the phase-spaces; in the conversation representation 1015 this can be seen by the presence of shadow panes
- Active versus inactive (who is active right now): The social proxy 1010 allows participants to assess the degree of activity of the members of the group by noting the position of participants’ dots relative to the center of each phase space

Another benefit of the present invention is that both the phased conversation representation 1015 and the phased social proxy 1010, by adding structure and richness to the conversation, permit it to be archived in novel forms. One such form is that of a persistent archive of the conversation with its contents organized according to conversation phases.

Because the activity of conversations participants is archived, the conversation can be replayed. Participants, or others interested in the conversation, can replay it at high speed to get a sense of the number of participants in each phase, the degree of coherence, and so on. To replay a previous completed phase, a player can select the corresponding phase-shape (e.g., 1050). As already described, this will result in the associated conversation being displayed in the conversation pane 1030. In the preferred embodiment, the conversation pane 1030 includes a scroll bar 1225, which can be used to scroll the presented conversation back and forth. Note that

the data displayed in the Phased Social Proxy 1010, will track that displayed in all panes of the phased conversation representation 1015. Thus, the objects 1270 and 1275 displayed in products pane 1040, will only appear at the point in the meeting that they were created. Similarly, if object 1270 is deleted at some point in the meeting, its representation will vanish when this point is reached during replay.

One will appreciate that an archived, completed phase of a given meeting can be replayed by a given user either during a later phase of the meeting, or after the entire meeting has been finished. One will also appreciate that the current invention also covers other methods of replaying the conversation, including but not limited to providing users with a VCR-like set of controls (i.e., rewind: ""<<; play: ">"; fast forward: ">>"; and stop:).

One will also appreciate that since a given meeting is provided by a persistent online service (as will be described in detail with reference to figures ???), a given user can participate both synchronously, responding in real time to inputs made by other others; or asynchronously, interacting when they are able, adding data entered previously, or adding comments to phases that have not yet begun.

One with regular skill in the art will appreciate that during the use of an instance of the current invention, the configuration of the given instance could be modified (e.g., by a user with sufficient rights, say the meeting manager). These modification include, but are not limited to the addition and deletion of one or more phase, as well as the reordering of one or more phases.

One with regular skill in the art will also appreciate that a given phase's state (e.g., completed) can be set either by a single (e.g., one with sufficient rights or in a particular role, like the

moderator of the particular phase). The phase's state can also be set by set of user, including, but not limited to a vote by all users currently active in the given phase.

The current invention also provides 3 extensions to the graphical user interface and multiphase online collaboration method (discussed in detailed with reference to figures 2, 3, and 4).

Figure 2 depicts an alternative version of phased social proxy 2000. Just as in 1000, this version uses phase-shapes 2010 - 2030 to represent the phases of a given meeting - the meeting represented here only having three phases, one phase-shape 2030 indicating that the phase associated with it has been completed. Here too, active participants are representing with dots 2040 - 2060, a given dot indicating which phase the associated user is currently participating in, with the dot's distance from the center of the phase-shape indicating the associated user's level of activity. The phase-shapes 2010-2030 in figure are not connected to each other in any way, as are those 1050-1090 in 1000. This indicates that there is no preset sequence to the meeting's phases.

Phased social proxy 2000 also contains 3 new types of icons: **arrows** 2080 - 2100; **squares** 2070, 2120 and 2130; and **triangles**, 2080 - 2100.

- **Pointed Queries** - represented by standalone arrows 2080 - 2100 pointing either towards or away from the phase shape to which they are associated - are questions which can be directed to one or more participants. An arrow pointing away from a given phase-shape, e.g., 2080 or 2100, represents a pending query, while an arrow 2090 pointing towards a given phase-shape represents a query that has already be answered. A Pointed Query will call itself to the attention of a user, either directly (if the user is logged onto the system), or (after a predetermined time)

will send itself as email to the user. The recipient of the emailed-pointed query can either click on an arrowhead to go to pointed query in the context of the online system, or can type an answer (including checking a “don’t know”) box. The answer to a given completed pointed query (e.g., 2090) can be accessed by selecting its arrow. Methods by which a given response can be seen include, but are not limited to having the response's data displayed in a pop-up window, or sent in an email.

- **To Do's** - represented by squares 2070, 2120 and 2130 located next to the phase shape to which they are associated - are indicators of tasks that still need to be completed; To Do's may optionally be assigned to particular people. Such task assignments can include, but are not limited to the gathering of additional related information, e.g., a search for prior art after a patent disclosure meeting, or contacting another group of users to see if they would like to join the current project.
- **Glosses** - represented by triangles 2080 - 2100 are typically summaries of the state a given phase, a given gloss being associated with the phase-shape to which it is nearest. Note that there can be glosses for both active phase, like that represented by phase-shape 2020, as well as ones that have been completed, like that represented by phase-shape 2030. One will appreciate that gloss can be used to indicate both intermediate (e.g., "Two conflicting solutions are being discussed; everyone seems dissatisfied") and final (e.g., "One of the two solutions was finally chosen, but a large number of group members are not pleased") comments of a given phase.

In addition a user can mark an objects (including rooms) with **Glitter** (relative to a user).

“Glitter” is a state that can be applied to an object by a user, to attract the attention of another user; it may have an optional note attached to it.

One will also appreciate that, participants can take on one of several roles, each of which has permissions associated with it:

Role	Conversation	Email	Meeting Creation	Purpose of Role
Chair	rwx	receive	rwx	Run meeting
Participant	rwx	receive		Normal participant
Lagger/Lurker	r	---	---	Non-participant, or someone who will be out of email contact for the duration of the meeting

Modes of Use: As noted above, this is intended to allow groups to have online, not-necessarily synchronous status meetings. At one extreme one could imagine that only the meetings chairs actually enter the online space, and they conduct the entire meeting by sending out pointed queries, and using the responses to generate Glosses and To Dos. At the other extreme, we could imagine a fully synchronous meeting, in which either everyone moves synchronously from item to item, or in which participants spread out over the agenda, gravitating to the most relevant topics, and filling in their statuses. In this pointed queries could be used to attract the attention of a particular participant when their input is required.

Figure 3 depicts yet another version of the phased social proxy 3000, which has 2 new aspects. The first is that its phase-shapes 3010 - 3060 are not all geometric shape. There are two rectangles 3010 and 3060, three circles 3020, 3040 and 3050; and one diamond 3030. These different shapes can be used to indicate types of phase tasks. So for example:

- Rectangular phase-shapes, like 3010 and 3060, could indicate introductory and summary phases;
- Circular phase-shapes, like 3020, 3040 and 3050, indicating design and development; and
- Diamond shapes, like 3030, indicating a decision point, e.g., "Will use a procedural or object-oriented programming language?").

The other new aspect of the phase social proxy 3000 is that in addition to connectors 3120 - 3160 between the phase shapes 3010 - 3160, like those 1100 - 1130 in 1000, one of 3000's phase shapes 3030 has two connectors coming from it, 3140 and 3150. This is a graphical

representation of how the choice made in the phase corresponding to phase-shape 3030 determines which phase is executed next, that corresponding to 3040, or 3050. This ability to represent conditional branching enables user to employ the current invention to conduct online meeting based on a given business procedure, like a workflow. Workflows can include but are not limited to, purchasing or travel expense accounting. Thus, 3000 might be an overview of the execution of an travel expense account, with phase-step 3010 being where the employee enters their expenses; 3020 where the employee and their boss discuss a particular expense item; 3030 where the boss and the account department determine which project will pay for the given trip; 3040 and 3050 corresponding to the two possible projects from which the fund are transferred; and 3060 being where the overall transaction summary reports are created and sent to the related parties.

The current invention also anticipates how a phase social proxy could be automatically generated from a existing workflow specification. ***This ... [ADD more if other inventors think this is worthwhile]***

Figure 4 depicts a final version of the phased social proxy 4000, which includes a graphic representation of a loop. As in 3000, the diamond-shaped phase-shape, 4040 in 4000, represents a choice point. This difference in 4000 is that in 4000, one of the connectors 4110 connects back to a previously visited phase-shape 4020. This represents the case of a loop structure, with phase-shapes 4020 through 4040 representing the loop steps to execute respectively each time through the loop, and with phase-shape 4050 representing the loop termination condition. Whenever the discussion reaches phase-shape 4050, the users must make a choice, and, depending on their answer, activity continues at either 4020 again, or at 4060.

In addition to providing a dynamically updated representation of the current state of the online meeting and the activity of its users, the current invention also provides access to graphical user interface to previously executed passes through the loop. Each of 4170, 4180 and 4190 (each a phase-shape-loop) represents passes through the loop, 4190 - the bottom-right-most one representing the most recent. If a user wants to see the loop's phase-shapes - including glosses, pointed queries and To Do's - as they looked during previous passes through the loop, they can select the corresponding phase-shape-loop,

For example, 4000 could represent the online discourse regarding the iterative design of a prototype, the phase-shapes representing the following topics:

- 4010, determination of the prototype's goals and metrics;
- 4020, development or update of the prototype's design;
- 4030, prototype implementation;
- 4040, user-testing of the prototype's latest implementation;
- 4050, evaluation of whether the prototype's goal's have been met; and
- 4060, Overall usage and installation documentation.

If a given user wanted to see the previous pass through the design-implement-test loop, they could select the 4180 phase-shape-loop. This would bring 4180 to the foreground, showing 4020-4040 as they looked at the beginning of this loop's execution. By scrolling through the

loop's execution, e.g., using the 1225 scroll bar, this activity that took place during this loop's execution can be reviewed.

One with regular skill in the art will appreciate that graphical representations of additional meeting-related products are also anticipated by the current invention. These include, but are not limited to arrow-shaped boxes positioned adjacent to a phased social proxy, which represents agenda items proposed for a subsequent meeting.

The preferred implementation of the current invention is as an web-based (HTTP-based) network application, as will be described in detail with reference to figures 5,6 and 7.

Figure 5 depicts an example of an overall logical network topology within which preferred embodiment of the current invention runs. As shown, a server 5010 (which will be described in detail with reference to figures 6 and 7)), and clients 5020 - 5040 are all connected to the network 5000, through which they communicate. Although only three clients 5020 - 5040 are shown in figure 5, the present invention is applicable to any number of clients.

The server 5010 can be any computing node able to act as an HTTP server. This includes, but is not limited to the products sold by IBM under the trademarks ThinkPad or PowerPC, running that can run the operating system and server application suite sold by Microsoft under the trademark Windows NT.

Examples of the network 5000 include, but are not limited to, the Internet and private intranets.

The clients 5020 - 5040 include any network node able to act as an HTTP client. Examples include, but are not limited to, an IBM ThinkPad running Windows 95 and a web browser such

as Microsoft's Internet Explore, or Apple's Power Macintosh running MacOS 8.5.6 and a web browser such as Netscape's Navigator. Clients also include network-connectable mobile (i.e. portable) devices such as that sold under the trademark WorkPad by IBM, as well as smart cellular telephones (i.e., devices which can act as a cellular telephone as well as run network applications, like web browsers), like that sold under the trademark Nokia 9000i by Nokia.

In the preferred implementation, the client application is an applet retrieved from the server 5010, and run via the client's HTTP client (web browser). Also, in the preferred implementation, this applet, in addition to handling data display and user interactions (e.g., data entry and mouse events), also constantly polls the server 5010 for updated data, this data being the latest version available for the meeting instance currently being viewed. Those with regular skill in the art will appreciate that there are other methods of retrieving such data, including, but not limited to having the server push updates, whenever available down to the client, the client listening on a port known to the server (for details, see Douglas Comer, **Internetworking with TCP/IP, Vol. 1 Principles, Protocols and Architecture**. Prentice Hall, Englewood Cliffs, New Jersey, 1991.).

Figure 6 depicts a more detailed example of the server 5010, which hosts the online Agenda-Driven Meeting environment. The server 5010 preferably includes a CPU 6000, a network interface 6010, a storage device 6020 such as a disk or DASD, and memory 6030, such as RAM. According to the present invention, the Agenda-Driven Meeting logic 6140 (as will be discussed in more detail with reference to Figure 7), is preferably embodied as computer executable code that is loaded from remote (e.g., over the network via the network interface 6010) or local permanent optical (CD-ROM) or magnetic storage such as disk, or DASD 6020 into memory 6030 for execution by CPU 6000. The memory 6030 preferably includes an HTTP handler 6050,

an Agenda-Driven Meeting Handler 6060 (discussed in detail with reference to Figure 7), and an Agenda-Driven Meeting database 6070. The HTTP handler 6050 can be any standard HTTP server, such as the product sold by the IBM under the trademark WebSphere.

The Agenda-Driven Meeting database 6070 can be any application providing access and persistent management of data, such as that sold by IBM under the trademark DB/2. Those with regular skill in the art will also appreciate that the Agenda-Driven Meeting database 6070 could be run on another remote network connected node and accessed via the network 5000.

Figure 7 depicts an example of the Agenda-Driven Meeting logic 6140. As shown, the server 5010 waits for input in 7000. The input is checked in step 7010, and unless it involves HTTP input, control is passed to a miscellaneous handler 7030, the details of which are beyond the scope of the current invention. One with regular skill in the art will appreciate that the check done in step 7010, could be accomplished by verifying that the TCP/IP port by which the server was contacted corresponds to that used to handle HTTP protocol, typically 80 (for details, see Douglas Comer, **Internetworking with TCP/IP, Vol. 1 Principles, Protocols and Architecture**. Prentice Hall, Englewood Cliffs, New Jersey, 1991.). If the input is HTTP-related, then the input is further checked in step 7020 to determine if it is Agenda-Driven Meeting related. If not, control is passed to the HTTP Handler 6050. Otherwise control is passed to the Agenda-Driven Meeting Handler 6060. One with regular skill in the art will appreciate that the check performed in step 7020 consists of that parsing the HTTP request and checking whether it contains one of a finite set of commands unique to the Agenda-Driven Meeting Handler 6060. Following the completion of any of the handlers, i.e., steps 6050, 6060 or 7030, the flow continues at step 7000, where the server 5010 waits for input.

The Agenda-Driven Meeting Handler 6060 shown in figures 6 and 7, is the interface that responds to all requests concerning agenda-driven meeting, thus controlling the creation and use of such online collaboration environments. As discussed with reference to figures 1,2,3, and 4, Agenda-Driven Meeting requests include the following:

- Creating a new instance;
- Connecting to a existing active instance (active or completed);
- Entering data into a active instance;
- Retrieving data from an (active or completed) instance;

For each request that arrives, the Agenda-Driven Meeting Handler 6060 determines its type and applicable agenda-driven meeting instance, processes the given event, updates the given meeting's data in the database 6070, updates the graphical representation for the given meeting instance - also stored in the database 6070; and then sends the updated graphical representation out to all active users of the given meeting instance.

The Agenda-Driven Meeting Handler processes different requests slightly differently:

- If the given request is to one to create a new agenda-driven meeting instance, then:
 - An entry for the new meeting is added to the database;
 - The number of phases and their interrelationship, if any, is added to the entry
 - A phased social proxy is created for the instance and stored in the database entry, this graphic including a representation of the creator and their level of activity;
 - The social proxy is added to the database entry;
 - All data for the instance is communicated back to the creator's client application.
- If the given request is one for a user to connect to any existing meeting instance, then:

- The user's id is added in as one of the active users in the requested meeting instance's database entry;
- The instance's phased social proxy is updated to reflect the new user's becoming active, this new proxy being stored in the instance's database entry;
- The meeting instance's updated data, including its phased social proxy, is sent to all active users;
- If the given request is one from a user asking to retrieve data from an existing meeting instance, then:
 - The particular piece of data being requested is identified;
 - The requester's access rights are checked to verify that they view the requested data, the server returning a warning to the requesting user if not;
 - The given meeting instance's phased social proxy is updated, to reflect the retrieval of the given piece of data (e.g., the given user's dot moves closer to center of their current phase-shape to reflect their level of activity), the modified phased social proxy added to the instance's database entry;
 - The fact that the given user requested the given piece of data is written into the meeting instance's database entry;
 - The meeting instance's updated data, including its phased social proxy, is sent to all active users;
 - The requested data is sent to the requesting user.
- If the given request is one from a user asking to enter data into an existing meeting instance, then:
 - The particular piece of data the requester is asking to add (e.g., a comment, To Do, or Pointed Query) is identified;
 - The requester's access rights are checked to verify that they are authorized to add the given piece of data, the server returning a warning to the requesting user if not;
 - The data is added into the given meeting instance's database entry;

- The given meeting instance's phased social proxy is updated to reflect the addition of the given piece of data, the modified phased social proxy added to the instance's database entry;
- The fact that the given user added the given piece of data is written into the meeting instance's database entry;
- The meeting instance's updated data, including its phased social proxy, is sent to all active users;
- If the given request is one from a user asking retrieve an archived meeting instance, then:
- The particular meeting instance the requester wants is identified;
- The requester's access rights are checked to verify that they are authorized to view the given instance, the server returning a warning to the requesting user if not;
- The server creating a new read-only version meeting instance, using the data - retrieved from the data - of the requested meeting instance;
- The new meeting instance's updated data, including its phased social proxy, is sent to all active users;

Having described embodiments for peer-to-peer interaction and more particularly to a method for flexibly relating information, it is noted that modifications and variations can be made by persons skilled in the art in light of the above teachings. It is therefore to be understood that changes may be made in the particular embodiments of the invention disclosed which are within the scope and spirit of the invention as defined by the appended claims. Having thus described the invention with the details and particularity required by the patent laws, what is claimed and desired protected by Letters Patent is set forth in the appended claims.

CLAIMS

We claim:

1. A method for providing an online collaborative environment for at least one user, the method consisting of the following steps:
 - Creating an instance of an online meeting, the instance including phases, and an agenda of the meeting's phases;
 - Receiving input from at least one user;
 - Depicting said input in a representation;
 - Forwarding said representation to said at least one user;
2. A method as recited in claim 1, further comprising:
 - Determining if a given meeting phase has been completed.
 - If said phase has been completed, then including indication of this in said representation.
3. A method as recited in claim 2, further comprising:
 - Determining if all meeting phases have been completed;
 - If all meeting phases have been completed, terminating the meeting instance;
 - If all meeting phases have not been completed, repeating the steps of receiving, determining, depicting, and forwarding until all phase specified in said agenda are completed.
4. A method as recited in claim 1, wherein said depicting includes an indication of an association of said input to one of the said phases (i.e., the phase to which the input was directed).
5. A method as recited in claim 1, wherein said depicting includes an indication of an association of said at least one user with of the said phases (i.e., the phase that the user is

completing or reviewing). (*Question: should the "instance" have the "association" since the association exists even if it is not represented?*)

6. A method as recited in claim 1, wherein the said agenda includes a specification of the type of each of the meeting's phases, the types including introduction, development, and decision.
7. A method as recited in claim 1, wherein the said agenda includes a specification of the interrelationship of the meeting's phases.
8. A method as recited in claim 7, wherein said interrelationship includes the order in which the phases are to be completed by said at least one user.
9. A method as recited in claim 2, where in the step of depicting includes an indication of said at least one user's activity.
10. A method as recited in claim 9, wherein said indication includes the overall number of or recency of the user's input.
11. A method as recited in claim 9, wherein said indication includes which phase said user is associated
12. A method as recited in claim 2, wherein said determining is based on input from said at least one user (e.g., input from a user equal to: "phase complete").
13. A method as recited in claim 2, wherein said determining is based on an analysis of activity (e.g., "there hasn't been any input for 2 days").

14. A method as recited in claim 1, wherein said user input is a meta-statement or summary about a given phase, and where said representation includes a handle to this input, which can later be used to retrieve said input (e.g., its text).
15. A method as recited in claim 1, wherein said user input is a query related to a given phase, and where said representation includes a handle to this query, which can later be used to retrieve said input (e.g., its text).
16. A method as recited in claim 15, wherein said query is directed to at least one user.
17. A method as recited in claim 15, wherein said user input is a response to said query, and where said representation includes a handle to this response, which can later be used to retrieve said input (e.g., its text).
18. A method as recited in claim 1, wherein said user input is a task specification (i.e., a "To Do") related to a given phase, and where said representation includes a handle to this task specification, which can later be used to retrieve said input (e.g., its text).
19. A method as recited in claim 18, where said task specification directed to at least one user.
20. A method as recited in claim 18, wherein said user input is an indication that said task specification has been completed, and where said representation includes a handle to this indication of completion.
21. A method as recited in claim 1, wherein said user input includes but is not limited to text, graphics, binary, multimedia and compound documents.

22. A method as recited in claim 1, wherein said at least one user can associate themselves (visit) with any phase, and wherein said representation includes an indication of this association.
23. A method as recited in claim 2, whereby no further input can be associated with a completed phase.
24. A method as recited in claim 2, whereby further input can be associated with a completed phase, and where said graphic representation provides an indication of such input.
25. A method as recited in claim 11, wherein said input is a signal of at least one user's interest in a particular query or response, and where said representation includes an indication of this interest (e.g., "glitter").
26. A method as recited in claim 7 (? 8? other?), of providing the dynamic determination of the next active phase.
27. A method as recited in claim 26, of providing the dynamic determination of the next active phase based on results of previous phase(s)
28. A method as recited in claim 26, of providing the dynamic determination of the next active phase based of analysis of participation;
29. A method as recited in claim 6, of creating said agenda based on a predefined workflow.
30. A method as recited in claim 29, wherein step workflow is that of a business process (e.g., processing a travel expense request).
31. A method as recited in claim 1, wherein said at least one user is assigned a role.

32. A method as recited in claim 31, wherein said type of input said at least one user can enter is restricted by said role.
33. A method as recited in claim 31, wherein said the associated phase into which said at least one user can enter input is restricted by said role.
34. A method as recited in claim 2, including the step of changing the association of said at least one user from said completed phase to the next phase, as defined by the agenda.
35. A method as recited in claim 34, wherein said representation includes an indication of this change of association.
36. A method as recited in claim 6, wherein the active phase takes central focus (e.g., moves to the center of the display, or expands to show inner contents; other phases moving to the periphery or shrinking).
37. A method as recited in claim 1, wherein said at least one user's interaction with said meeting instance is synchronous (in real-time).
38. A method as recited in claim 1, wherein said at least one user's interaction with said meeting instance is asynchronous (e.g., copied to a PC, disconnected and then reviewed).
39. A method as recited in claim 1, of showing relative average level of activity with phases (e.g., phases 1 & 3 are very active, while phase 2 was only moderately active).
40. A method as recited in claim 2, enabling several (e.g., a set) of phases to all be active at once.

41. A method as recited in claim 40, of enabling a set of phases to be treated as a single unit (e.g., having a single summary or a single activity level).
42. A method as recited in claim 1, of providing storing agendas, i.e., templates, for later reuse (in *other* future meeting instances).
43. A method of adding deleting phases to current environment (including specification of type and transitions).
44. A method as recited in claim 42, of saving the agenda of the current meeting instance.
45. A method as recited in claim 6, of providing a loop in said agenda (e.g., a phase transition from one phase to an earlier phase).
46. A method as recited in claim 45, of providing a graphic representation of one or more interactions of a given loop.
47. A method as recited in claim 46, enabling said at least one user to review earlier iteration of said loop.
48. A method as recited in claim 1, wherein said representation includes both graphic and text section.
49. A method as recited in claim 48, where the content of said text section is adjusted to match the point of focus in the graphic section (e.g., the current phase's text is shown when the user is associated with the current phase, while a given previous phase's text input is shown when the user is visiting said previous phase).

50. A method as recited in phase 1, by which a given meeting instance can be replayed.
51. A method as recited in phase 1, of showing a said at least one user's visiting a previous or future phase.
52. A method as recited in phase 1, of graphically representing said at least one user's posting input into previous or future phases.
53. A system for providing an instance of an online collaborative meeting for at least one user, the system consisting of the following:
- A database that provides persistent access to data;
 - A server, enables the creation of an instance of an agenda driven meeting; and which receives all meeting inputs, logs said inputs in said database, updates a representation of said instance, and forwards the representation to said at least one user.
 - At least one client enabling said at least one user to enter and input and receive said representation.
54. A method as recited in claim 53, wherein said receiving and forwarding is uses the HTTP protocol (i.e., web-based).
55. A method as recited in claim 53, wherein the server is a web-portal.
56. A method as recited in claim 3, further comprising creating an archive version of the completed meeting instance.
57. A method as recited in claim 56, further comprising:
- Said at least one user retrieving said meeting archive; and
 - Said at least one user replaying said meeting instance, said replay including at least one of the instances phases..

Agenda-Driven Meeting GUI

ABSTRACT

The current invention provides agenda-driven meetings (ADM) allowing a distributed set of users to have an online, not necessarily synchronous meeting. One critical feature of an ADM instance is its agenda, which specifies both the topics or goals of the meeting's phases, as well as the interrelationship between the phases, this phase interrelationship including the order of execution. In addition, an ADM provides a graphical representation, which shows the status of each phase - including indicators of user participation - as well as the relationship between the phases. Input can include text comments; queries, potentially directed to one or more users; responses to these queries; task assignments, also potentially directed to one or more users; summaries of phases; and indicators of users interest in a given query or response. The ADM graphic representation reflects each of the elements just mention, including the particular phase to which a given element is related. Finally, the current invention allows a given user to replay a given ADM instance, even after the meeting has been completed.

Figure 1

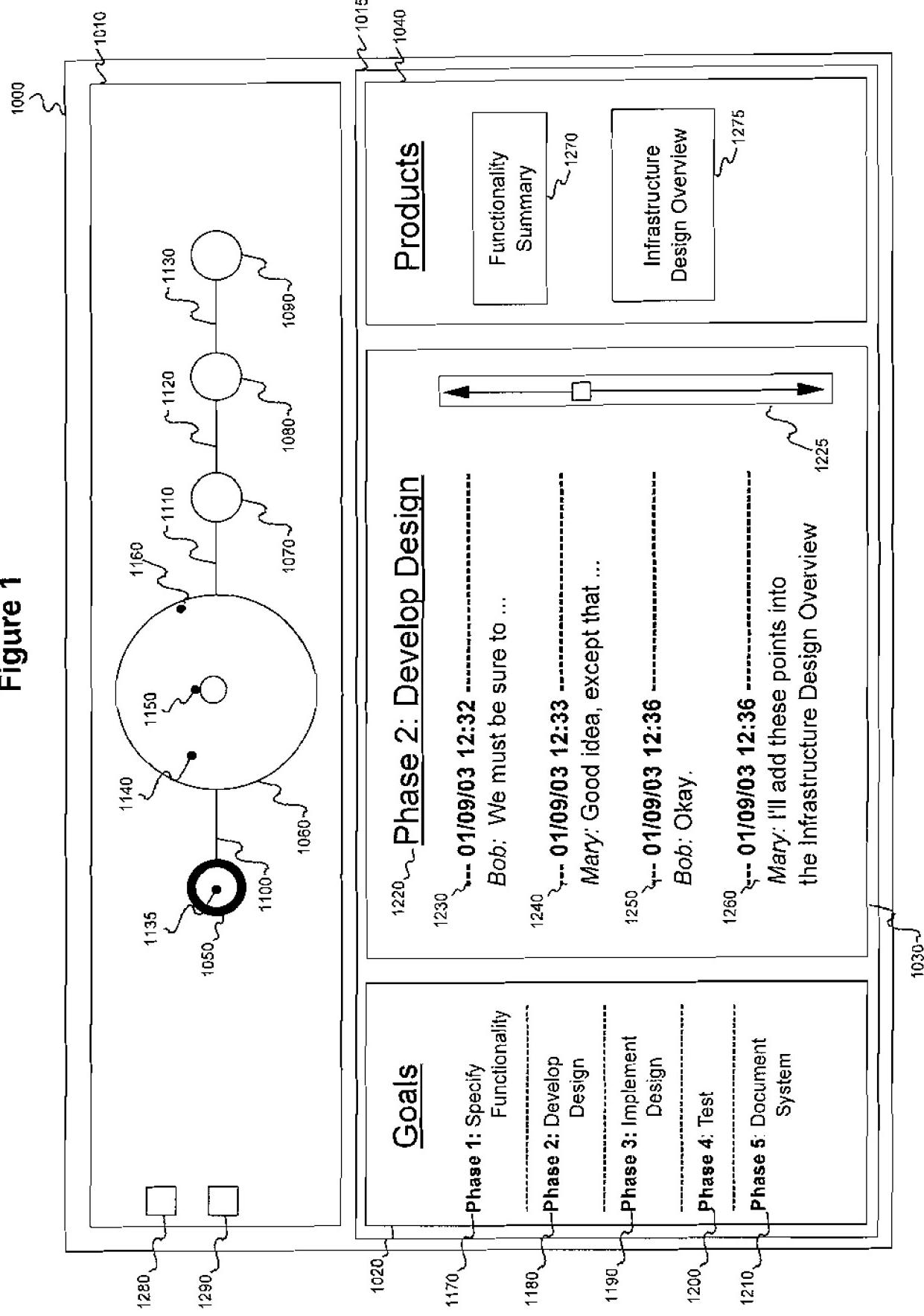


Figure 2

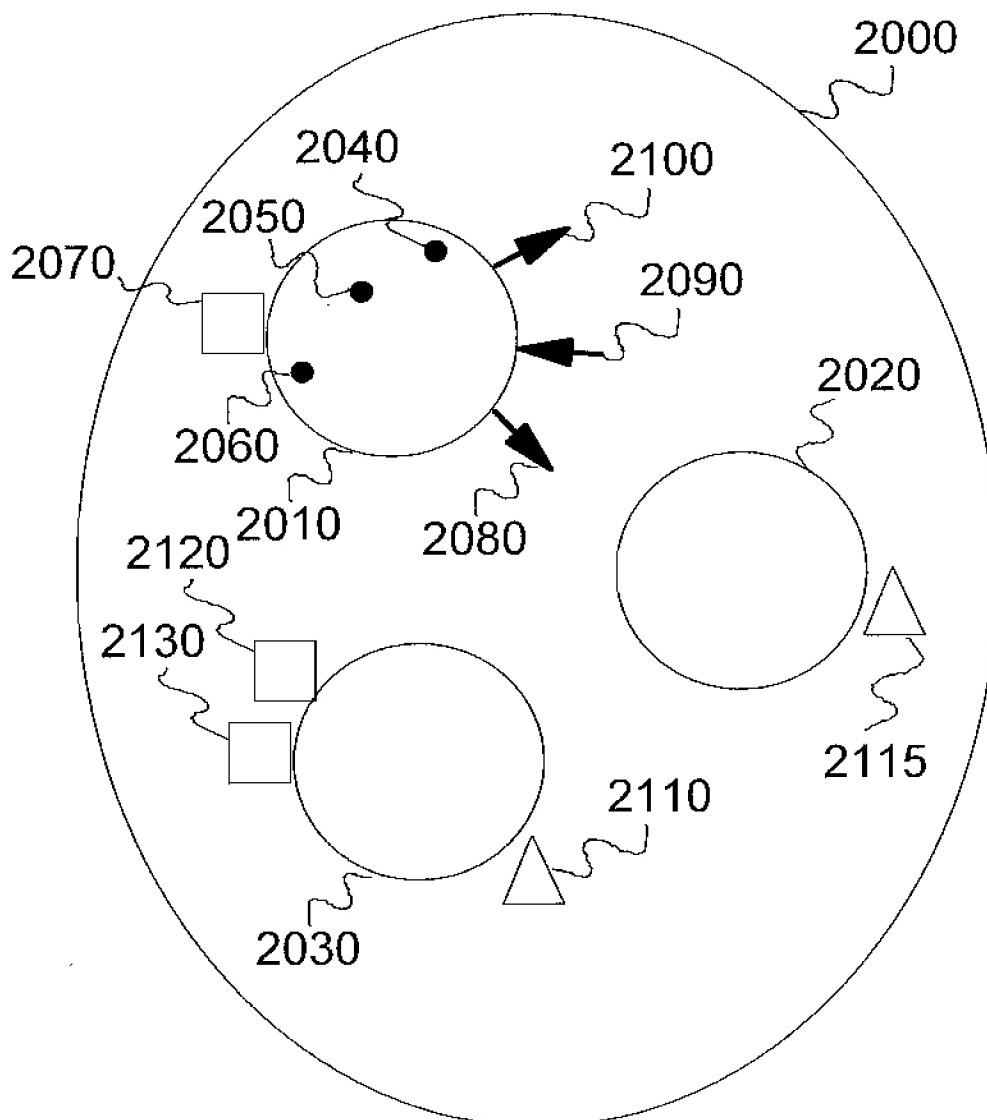


Figure 3

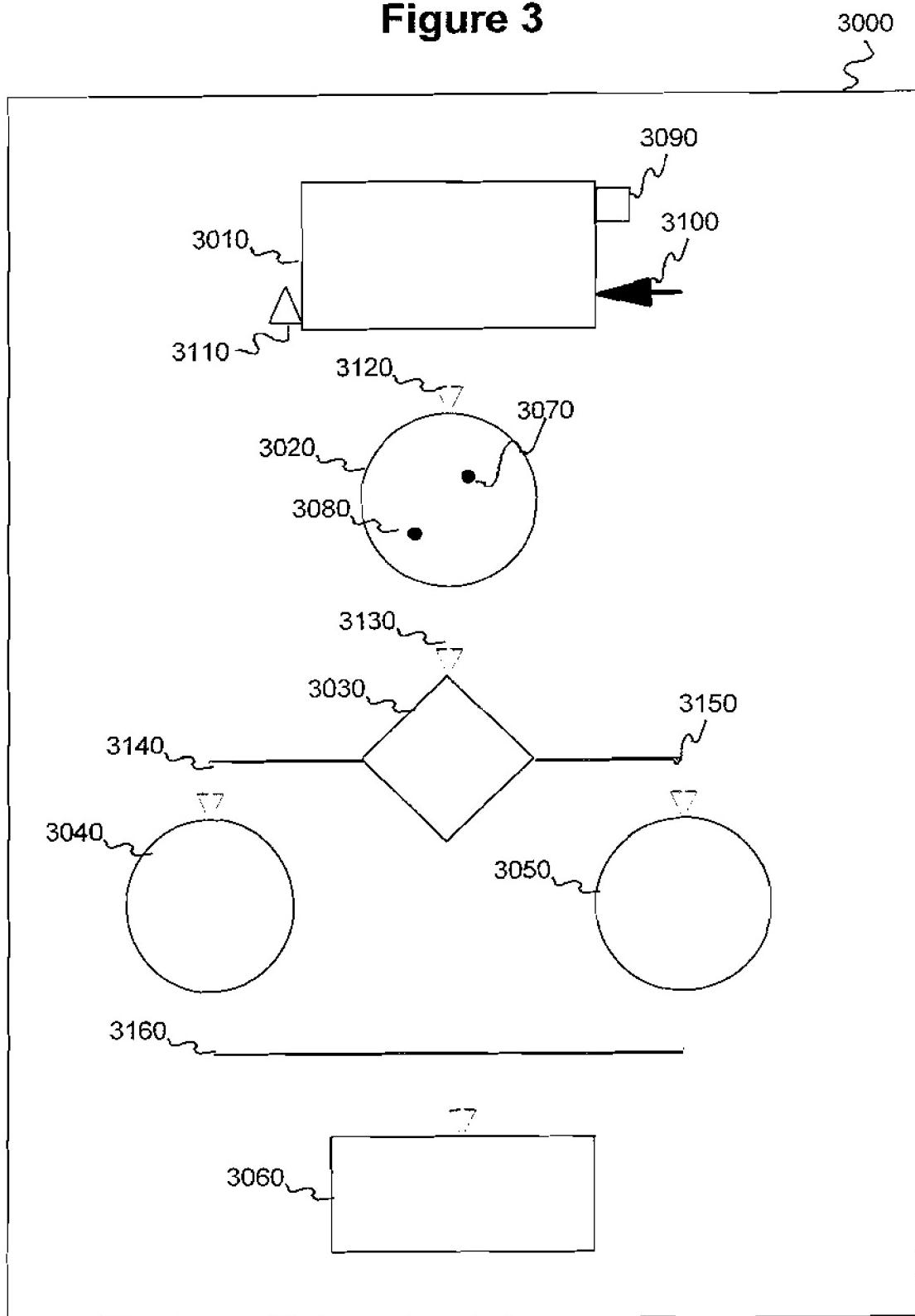


Figure 4

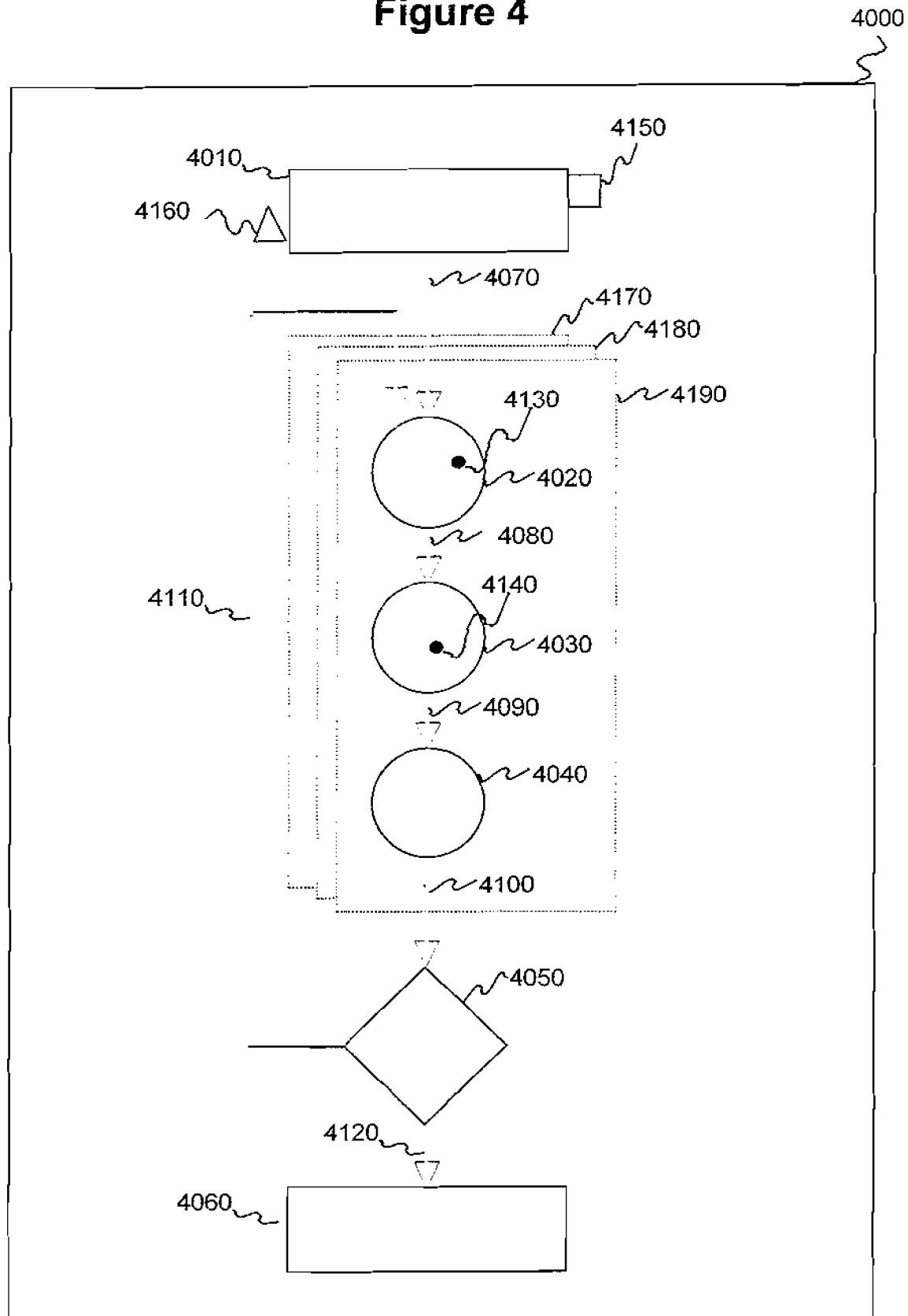


Figure 5

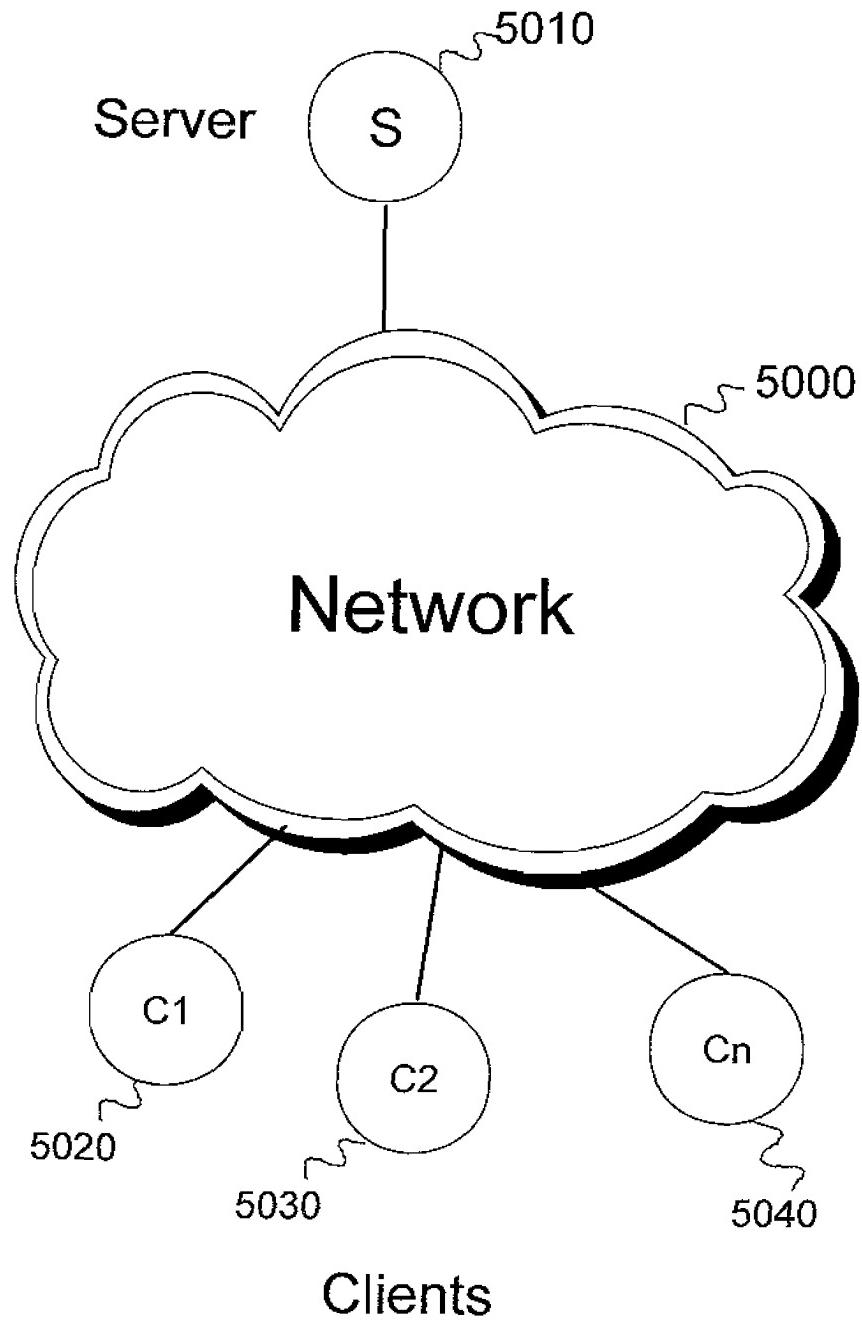


Figure 6

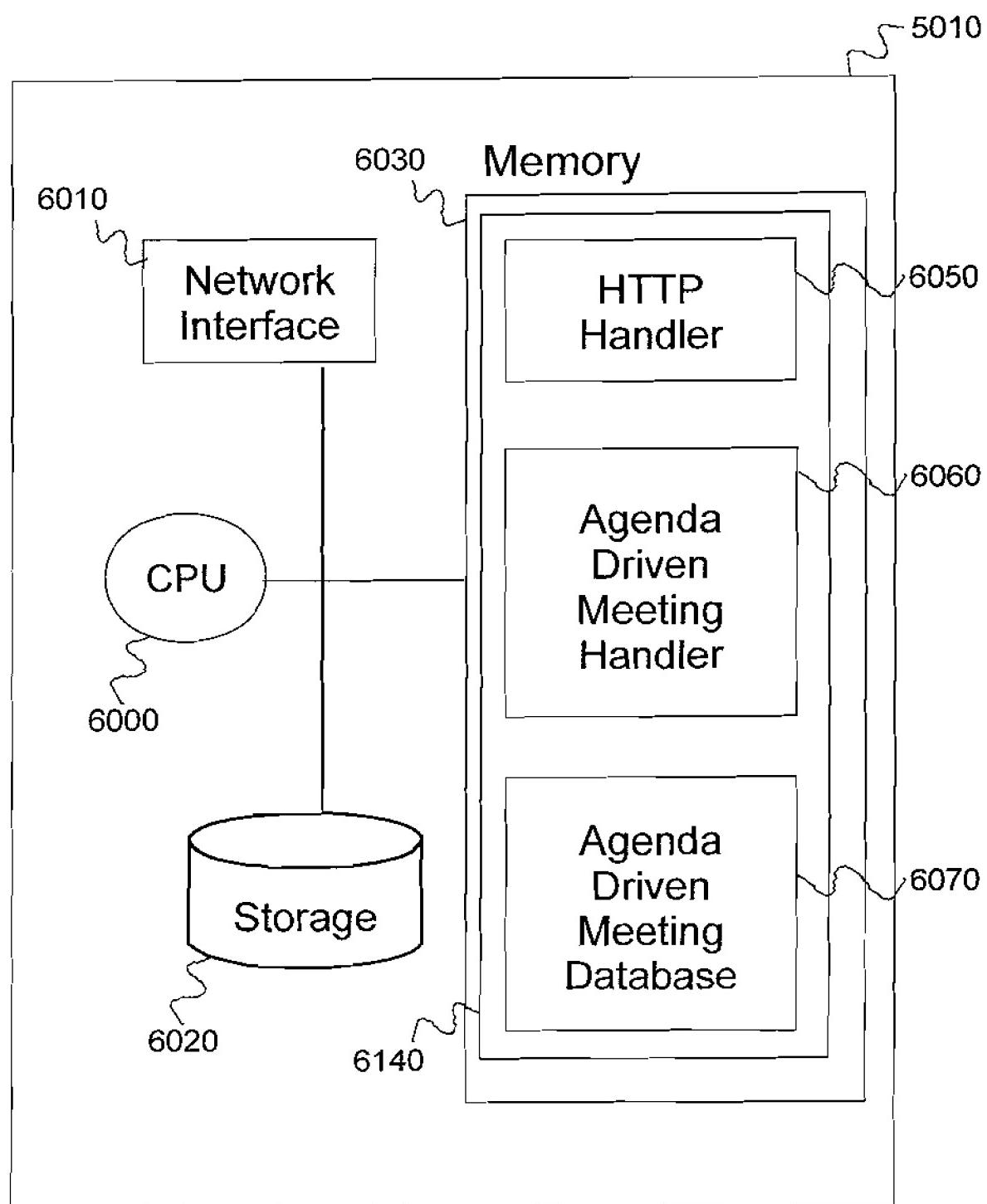
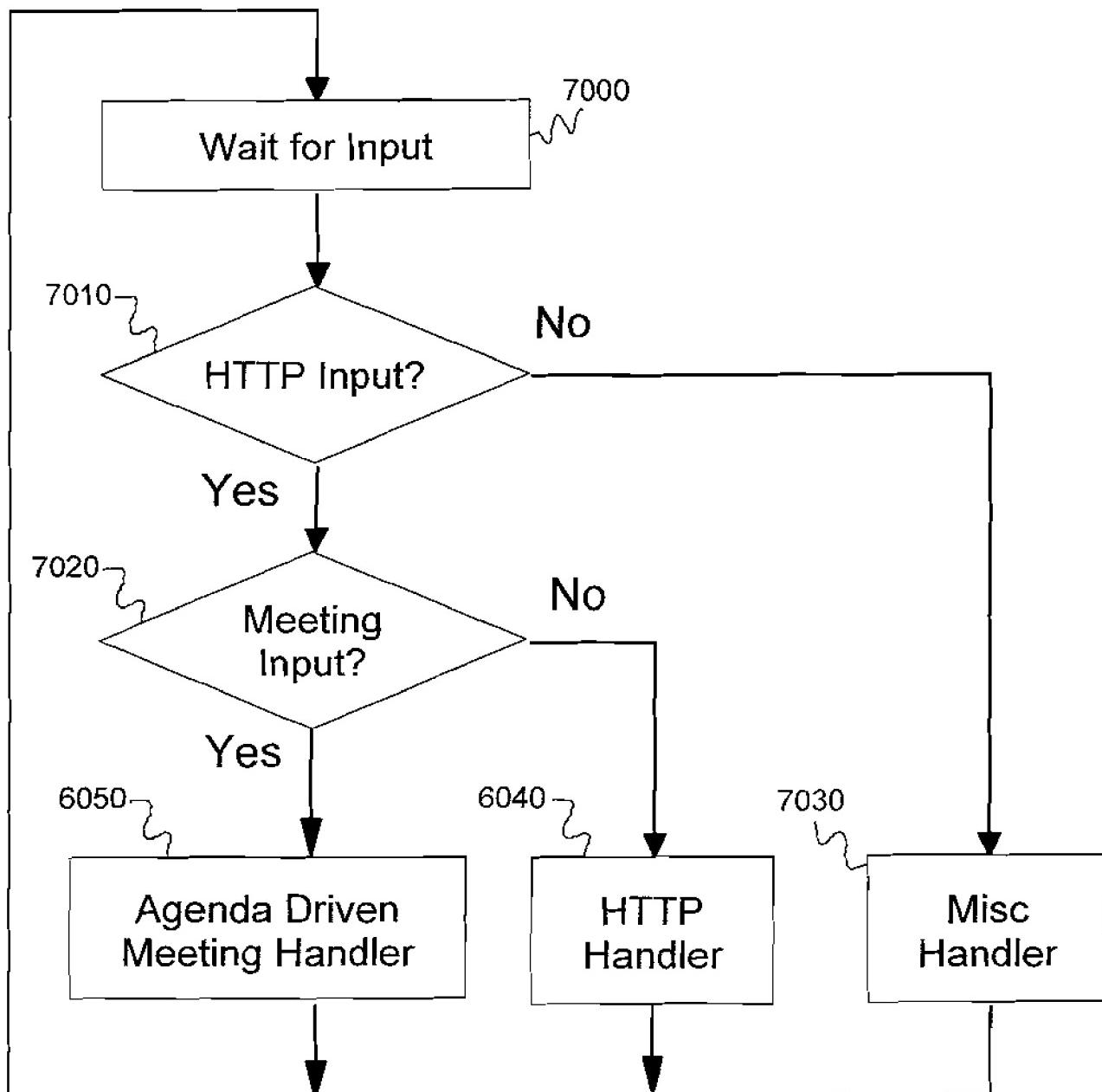


Figure 7



Docket

Docket YOR9-2003-0090-US1

Application 10/628217

Prepared for and/or by an IBM Attorney - (IBM Confidential)

Created By Kathy Cognatello On 04/04/2003 04:25:24 PM
Last Modified By Kathy Cognatello On 09/25/2007 05:04:10 PM

Disclosure YOR8-2000-1082
Merged Disclosures YOR8-2001-0404

Title
AGENDA DRIVEN MEETINGS

Status	Pending
File date	28-Jul-2003
Abandon date	
Application number	10/628217
Priority date	26-Jul-2003
Processing location	YOR
Responsible attorney	Lisa M Yamonaco/Watson/IBM
Task attorney	
Task administrator	Wendy R Petrovich/Watson/IBM
Outside counsel firm	Anne Vachon Dougherty (VLF)
Technology code	
PPM tech area	600 - Software/Services/Applications/Solutions
PPM rating	
Application jurisdiction	US
Application type	Regular
Intellectual property type	Utility Patent
Patent ownership	IBM Only
Owning division	RES
Owning functional area	909 User interfaces, multimodal system and software technologies
PPM selected countries	

To view this patent on the web site, click -->

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Main Idea for Disclosure YOR8-2000-1082

Prepared for and/or by an IBM Attorney - IBM Confidential

Archived On 06/05/2003 01:03:55 AM

Title of disclosure (in English)

A Dynamic Graphical Representation of a Spatialized Process Showing Intermediate States to be used as a Social Resource for Supporting Collective Interaction.

Main Idea

1. Describe your invention, stating the problem solved (if appropriate), and indicating the advantages of using the invention.

The goal of an agenda-driven meeting (ADM) conversation is to allow a distributed work group, committee, or task force to have an online, not necessarily synchronous meeting to review the status of various on-going projects. An ADM is created by defining an agenda consisting of a list of items: the agenda, and each individual item, collectively define a set of rooms (or stages) within which each item is discussed. That is, an ADM consists of:

- · An Agenda Room
- · Item 1 Room
- · ...
- · Item N Room

Four sorts of objects can be created in each room:

- · Utterances: An utterance is a labeled, time-stamped textual comment, which, with other utterances, make up the conversation in a room.
- · Pointed Queries: Pointed Queries are questions which can be directed to one or more participants. A Pointed Query will call itself to the attention of a user, either directly (if the user is logged onto the system), or (after a pre-determined time) will send itself as email to the user. The recipient of the emailed-pointed query can either click on a link to go to pointed query in the context of the online system, or can type an answer (including checking a "don't know" box).
- · To Do's (which may optionally be assigned to particular people)
- · Glosses (which are typically summaries of the state of an agenda item)

Objects, including rooms, can have various states:

- · Open/Locked: An object that is "open" can be entered, edited, or answered, as appropriate;
- · New Information/Seen (relative to a user): An object that has been created or contains new or changed content since a user last "looked at" it is in the "New Information" state relative to that user.
- · Glitter/No Glitter (relative to a user): "Glitter" is a state that can be applied to an object by a user, to attract the attention of another user; it may have an optional note attached to it.

Finally, participants can take on one of several roles, each of which has permissions associated with it:

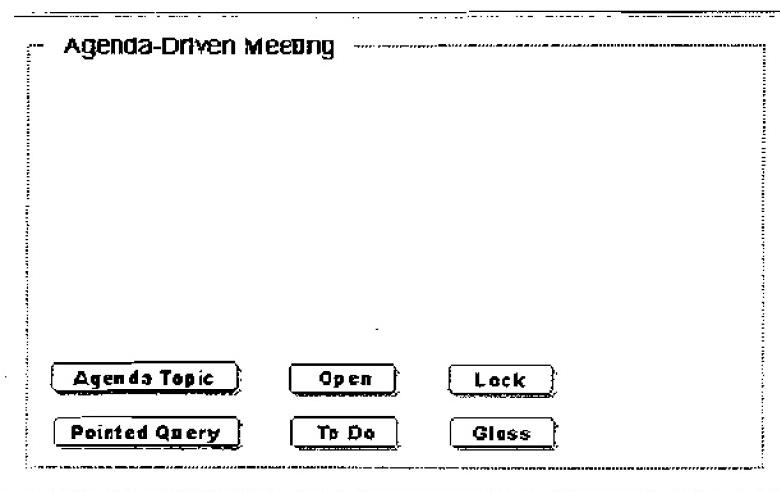
- RoleActivity Conversation Email Structuring Purpose of Role
- Chair rwx receive rwx Run meeting
- Participant rwx receive Normal participant
- Lagger/Lurker r --- Non-participant, or someone who will be out of email contact for duration of meeting

Modes of Use

As noted above, this is intended to allow groups to have online, not-necessarily synchronous status meetings. At one extreme one could imagine that only the meetings chairs actually enter the online space, and they conduct the entire meeting by sending out pointed queries, and using the responses to generate Glosses and To Dos. At the other extreme, we could imagine a fully synchronous meeting, in which either everyone moves synchronously from item to item, or in which participants spread out over the agenda, gravitating to the most relevant topics, and filling in their statuses. In this pointed queries could be used to attract the attention of a particular participant when their input is required.

The ADM Landscape Proxy

The figure below shows the ADM Landscape proxy. It provides an overview of the entire ADM conversation, and reflects the state of most of its objects



The ADM Room Proxy

The ADM Room proxy is fairly similar to the 'Babbie Classic' proxy. It shows the participants synchronously present in the room, and gives an idea of the recency of their activity in the usual manner. In addition, the room proxy shows previous visitors around the outside of the room, using empty dots to designate someone not present – those who have visited since the users' previous visit to the room are shown in green so that the user can tell who has been around since his/her last visit. Of course, the room proxy also shows the Pointed Query iconettes (arrows), and the todo iconettes (boxes) and the gloss iconettes (diamonds)..

2. How does the invention solve the problem or achieve an advantage,(a description of "the invention", including figures inline as appropriate)?

3. If the same advantage or problem has been identified by others (inside/outside IBM), how have those others solved it and does your solution differ and why is it better?

Main Idea for Disclosure YOR8-2001-0404

Prepared for and/or by an IBM Attorney - IBM Confidential

Archived On 06/05/2003 01:02:06 AM

Title of disclosure (in English)

Phased (semi-structured) Conversation with phased social proxy

Main idea

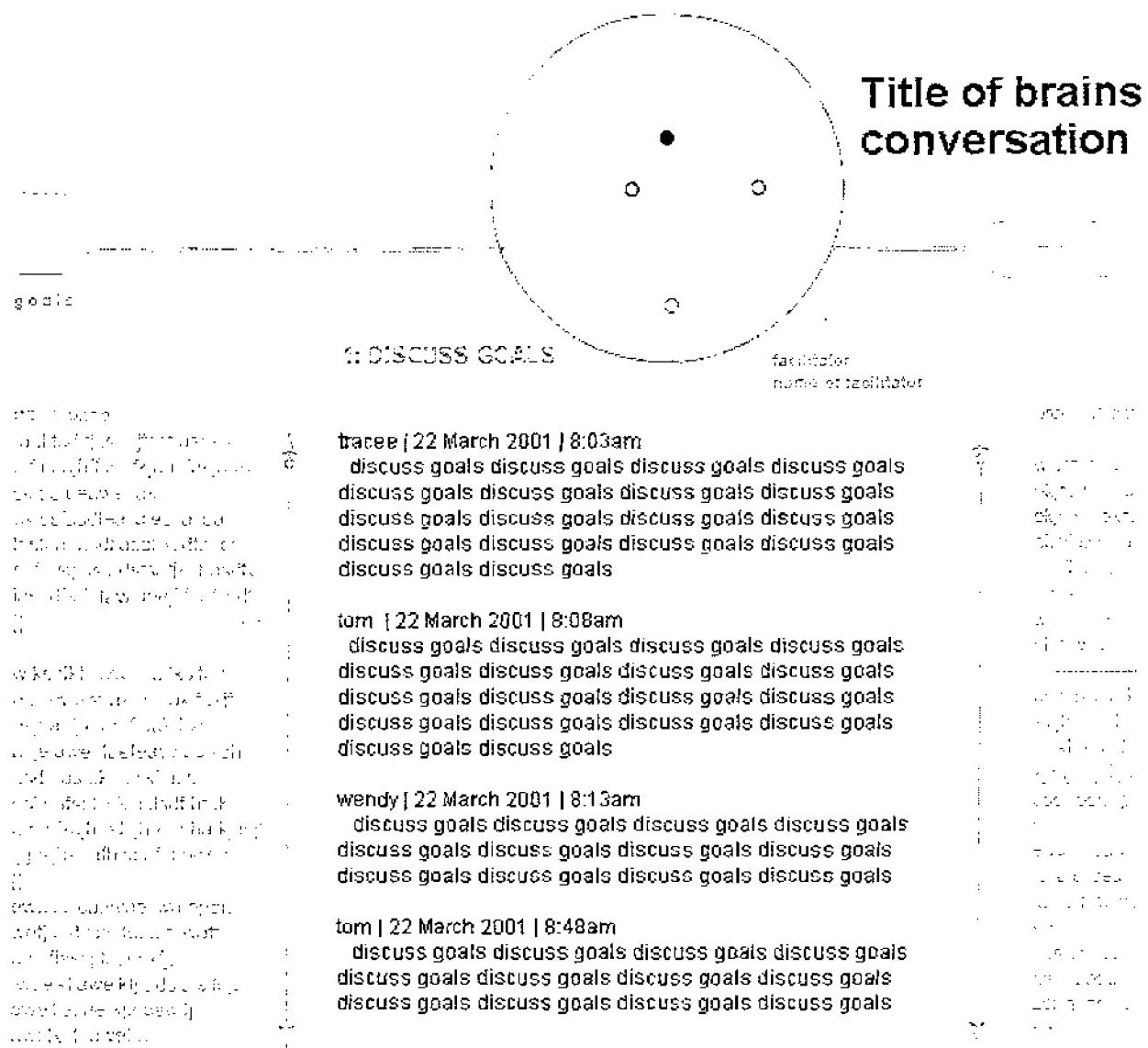
1. Describe your invention, stating the problem solved (if appropriate), and indicating the advantages of using the invention.

This invention provides a user interface resource that aids online group communication through a phased task or goal-oriented conversation. The invention uses a phased social proxy to explicitly display behavior within all phases of the process. The invention uses a multi-pane approach to conversation that complements the phased social proxy and enables the conversation to be refined towards an outcome.

2. How does the invention solve the problem or achieve an advantage,(a description of "the invention", including figures inline as appropriate)?

The following features describe the aspects that contribute to the phased conversation and representation of interactive behavior:

- 1 phased visualization: separates process into distinct parts of the whole visually evident which phase is currently active group efforts are focused and encouraged within the active phase (other phases are 'frozen')
- 2 three panes (goals, discussion, key points): offers a way of annotating the process in a way that encourages progress and workflow (always viewable, take key points forward as a progressive summary accumulation of the process)
- 3 social awareness feature (Phased Conversation proxy): accentuates the collaborative effort and offers ways to maintain group focus (being able to see where people are, what they're paying attention to, when they're 'off the subject': visual cues of deviant behavior offers subliminal pressures for staying with the group)
- 4 flexibility of social environment encourages the group to make and enforce decisions thereby making a democratic process (group may choose facilitators, discuss goals, decide as a whole when they're ready to move forward to the next phase... or back to a previous phase).
- 5 Tools: there to offer help in achieving goals, may be specific to a phase or user group that enables the process to move forward smoothly and resourcefully
- 6 Archive the process in a state that is easy to remember where information is located (according to phases) and preserves all user input, discussion and activity.



3. If the same advantage or problem has been identified by others (inside/outside IBM), how have those others solved it and does your solution differ and why is it better?
4. If the invention is implemented in a product or prototype, include technical details, purpose, disclosure details to others and the date of that implementation.